

WHAT IS CLAIMED IS:

Sub Cl. 1

1 A reinforced laminate adapted for an electronic support, the laminate comprising:

- 5 (a) a matrix material; and  
(b) at least one non-degreased fabric comprising at least one strand comprising a plurality of fibers, wherein at least a portion of the fabric has a coating which is compatible with the matrix material in the reinforced laminate adapted for the electronic support.

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2. A reinforced laminate according to claim 1, wherein the compatible coating comprises a plurality of particles.

- 15 3. A reinforced laminate according to claim 2, wherein the particles are formed from materials selected from polymeric inorganic materials, non-polymeric inorganic materials, polymeric organic materials, non-polymeric organic materials, composite materials and mixtures of any of the foregoing.

- 20 4. A reinforced laminate according to claim 3, wherein the polymeric inorganic materials are selected from polyphosphazenes, polysilanes, polysiloxane, polygermanes, polymeric sulfur, polymeric selenium, silicones and mixtures of any of the foregoing.

- 25 5. A reinforced laminate according to claim 3, wherein the non-polymeric inorganic materials are selected from graphite, metals, oxides, carbides, nitrides, borides, sulfides, silicates, carbonates, sulfates, hydroxides, and mixtures of any of the foregoing.

- 30 6. A reinforced laminate according to claim 3, wherein the polymeric organic materials are selected from thermosetting materials, thermoplastic materials, and mixtures thereof.

7. A reinforced laminate according to claim 6, wherein the polymeric organic materials are thermosetting materials selected from thermosetting polyesters, vinyl esters, epoxy materials, phenolics, aminoplasts, thermosetting polyurethanes, and mixtures of any of the foregoing.

8. A reinforced laminate according to claim 6, wherein the polymeric organic materials are thermoplastic materials selected from thermoplastic polyesters, polycarbonates, polyolefins, acrylic polymers, polyamides, thermoplastic polyurethanes, vinyl polymers, and mixtures of any of the foregoing.

9. A reinforced laminate according to claim 3, wherein the composite materials are selected from particles that have a hardness at their surface that is different from the hardness of the internal portions of the particle beneath its surface.

10. A reinforced laminate according to claim 9, wherein the composite materials are selected from particles formed from a primary material that is coated, clad or encapsulated with at least one secondary material.

11. A reinforced laminate according to claim 9, wherein the composite materials are selected from particles formed from a primary material that is coated, clad or encapsulated with a differing form of the primary material.

12. A reinforced laminate according to claim 2, wherein the particles have a thermal conductivity of at least 1 Watt per meter K at a temperature of 300 K.

13. A reinforced laminate according to claim 2, wherein the particles have a Mohs' hardness value which does not exceed the Mohs' hardness value of any glass fiber in the at least one strand.

14. A reinforced laminate according to claim 2, wherein the particles have an average particle size sufficient to allow strand wet out.

15. A reinforced laminate according to claim 2, wherein the particles have an average particle size, measured according to laser scattering techniques, ranging from 0.1 to 5 microns.

5 16. A reinforced laminate according to claim 2, wherein the compatible coating further comprises at least one lubricious material different from the plurality of particles.

10 17. A reinforced laminate according to claim 2, wherein the compatible coating further comprises at least one film-forming material.

15 18. A reinforced laminate according to claim 1, wherein the compatible coating has a loss on ignition of ranging from 0.1 to 1.6, and an air permeability, measured according to ASTM D 737, of no greater than 10 standard cubic feet per minute per square foot.

19. A reinforced laminate according to claim 2, wherein the resin compatible coating further comprises a resin reactive diluent.

20 20. A fabric according to claim 19, wherein the resin reactive diluent is a lubricant comprising one or more functional groups capable of reacting with an epoxy resin system and selected from the group consisting of amine groups, alcohol groups, anhydride groups, acid groups and epoxy groups.

25 21. A method of forming a reinforced laminate adapted for an electronic support comprising:

(a) obtaining a fabric adapted to reinforce an electronic support by weaving at least one fill yarn comprising a plurality of fibers and having a first resin compatible coating on at least a portion of the at least one fill yarn and at least one  
30 warp yarn comprising a plurality of fibers and having a second resin compatible coating on at least a portion of the at least one warp yarn;

(b) at least partially coating at least a portion of the fabric with a matrix material resin;

(c) at least partially curing the at least partially coated fabric to form a prepreg layer; and

5 (d) laminating two or more prepreg layers together to form a laminate adapted for use in the electronic support.

22. A prepreg for an electronic support comprising

(a) a matrix material; and

10 (b) at least one non-degreased fabric comprising at least one strand comprising a plurality of fibers, wherein at least a portion of the fabric has a coating which is compatible with the matrix material.

23. A prepreg according to claim 22, wherein the compatible coating  
15 comprises a plurality of particles.

24. A prepreg according to claim 23, wherein the particles are formed from materials selected from polymeric inorganic materials, non-polymeric inorganic materials, polymeric organic materials, non-polymeric organic materials, composite  
20 materials and mixtures of any of the foregoing.

25. A prepreg according to claim 24, wherein the polymeric inorganic materials are selected from polyphosphazenes, polysilanes, polysiloxane, polygermanes, polymeric sulfur, polymeric selenium, silicones, and mixtures of any  
25 of the foregoing.

26. A prepreg according to claim 24, wherein the non-polymeric inorganic materials are selected from graphite, metals, oxides, carbides, nitrides, borides, sulfides, silicates, carbonates, sulfates, hydroxides, and mixtures of any of the  
30 foregoing.

27. A prepreg according to claim 24, wherein the polymeric organic materials are selected from thermosetting materials, thermoplastic materials, and mixtures thereof.

5 28. A prepreg according to claim 27, wherein the polymeric organic materials are thermosetting materials selected from thermosetting polyesters, vinyl esters, epoxy materials, phenolics, aminoplasts, thermosetting polyurethanes and mixtures of any of the foregoing.

10 29. A prepreg according to claim 27, wherein the polymeric organic materials are thermoplastic materials selected from thermoplastic polyesters, polycarbonates, polyolefins, acrylic polymers, polyamides, thermoplastic polyurethanes, vinyl polymers and mixtures of any of the foregoing.

15 30. A prepreg according to claim 24, wherein the composite materials are selected from particles that have a hardness at their surface that is different from the hardness of the internal portions of the particle beneath its surface.

20 31. A prepreg according to claim 30, wherein the composite materials are selected from particles formed from a primary material that is coated, clad or encapsulated with at least one secondary material.

25 32. A prepreg according to claim 30, wherein the composite materials are selected from particles formed from a primary material that is coated, clad or encapsulated with a differing form of the primary material.

33. A prepreg according to claim 23, wherein the particles have a thermal conductivity of at least 1 Watt per meter K at a temperature of 300 K.

30 34. A prepreg according to claim 23, wherein the particles have a Mohs' hardness value which does not exceed the Mohs' hardness value of any glass fiber in the at least one strand.

35. A prepreg according to claim 23, wherein the particles have an average particle size sufficient to allow strand wet out.

5 36. A prepreg according to claim 23, wherein the particles have an average particle size, measured according to laser scattering techniques, ranging from 0.1 to 5 microns.

10 37. A prepreg according to claim 23, wherein the compatible coating further comprises at least one lubricious material different from the plurality of particles.

15 38. A prepreg according to claim 23, wherein the compatible coating further comprises at least one film-forming material.

20 39. A prepreg according to claim 22, wherein the compatible coating has a loss on ignition of ranging from 0.1 to 1.6, and an air permeability, measured according to ASTM D 737, of no greater than 10 standard cubic feet per minute per square foot.

25 40. An electronic support comprising  
(a) at least one non-degreased fabric comprising at least one strand comprising a plurality of fibers, wherein at least a portion of the fabric has a coating which is compatible with a matrix material; and

(b) at least one matrix material on at least a portion of the at least one fabric.

30 41. An electronic support according to claim 40, wherein the compatible coating comprises a plurality of particles.

42. An electronic support according to claim 41, wherein the particles are formed from materials selected from polymeric inorganic materials, non-polymeric

inorganic materials, polymeric organic materials, non-polymeric organic materials, composite materials, and mixtures of any of the foregoing.

43. An electronic support according to claim 41, wherein the particles  
5 have an average particle size sufficient to allow strand wet out.

44. An electronic support according to claim 41, wherein the particles  
have an average particle size, measured according to laser scattering techniques,  
ranging from 0.1 to 5 microns.

10 45. An electronic support according to claim 41, wherein the compatible  
coating further comprises at least one lubricious material different from the plurality  
of particles.

15 46. An electronic support according to claim 41, wherein the compatible  
coating further comprises at least one film-forming material.

47. An electronic support according to claim 40, wherein the compatible  
coating has a loss on ignition of ranging from 0.1 to 1.6, and an air permeability,  
20 measured according to ASTM D 737, of no greater than 10 standard cubic feet per  
minute per square foot.

48. A method of forming an electronic support comprising:  
(a) obtaining a fabric adapted to reinforce an electronic support by  
25 weaving at least one fill yarn comprising a plurality of fibers and having a first resin  
compatible coating on at least a portion of the at least one fill yarn and at least one  
warp yarn comprising a plurality of fibers and having a second resin compatible  
coating on at least a portion of the at least one warp yarn;  
(b) at least partially coating at least a portion of the fabric with a matrix  
30 material resin;  
(c) at least partially curing the coating into the at least a portion of the  
fabric to form a prepreg layer; and

(d) laminating one or more prepreg layers together with one or more electrically conductive layers to form the electronic support.

49. An electronic circuit board comprising:

5 (a) an electronic support comprising

(i) at least one non-degreased fabric comprising at least one strand comprising a plurality of fibers, wherein at least a portion of the fabric has a coating which is compatible with a matrix material; and

10 (ii) at least one matrix material on at least a portion of the at least one fabric; and

(b) an electrically conductive layer, the support and the conductive layer being contained in the electronic circuit board.

50. An electronic circuit board according to claim 49, wherein the  
15 compatible coating comprises a plurality of particles.

51. An electronic support according to claim 50, wherein the particles are formed from materials selected from polymeric inorganic materials, non-polymeric inorganic materials, polymeric organic materials, non-polymeric organic materials,  
20 composite materials, and mixtures of any of the foregoing.

52. An electronic support according to claim 50, wherein the particles have an average particle size sufficient to allow strand wet out.

25 53. An electronic support according to claim 50, wherein the particles have an average particle size, measured according to laser scattering techniques, ranging from 0.1 to 5 microns.

30 54. An electronic support according to claim 50, wherein the compatible coating further comprises at least one lubricious material different from the plurality of particles.





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